Volunteer Lake Assessment Program Individual Lake Reports

BAPTIST POND, SPRINGFIELD, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,664	**Max. Depth (m):**	7.5	**Flushing Rate (yr^{1})**	3.7
Surface Area (Ac.):	99	**Mean Depth (m):**	2.4	**P Retention Coef:**	0.56
Shore Length (m):	2,900	**Volume (m^{3}):**	972,500	**Elevation (ft):**	1266

TROPHIC CLASSIFICATION

Year	Trophic class
1980	MESOTROPHIC
1996	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

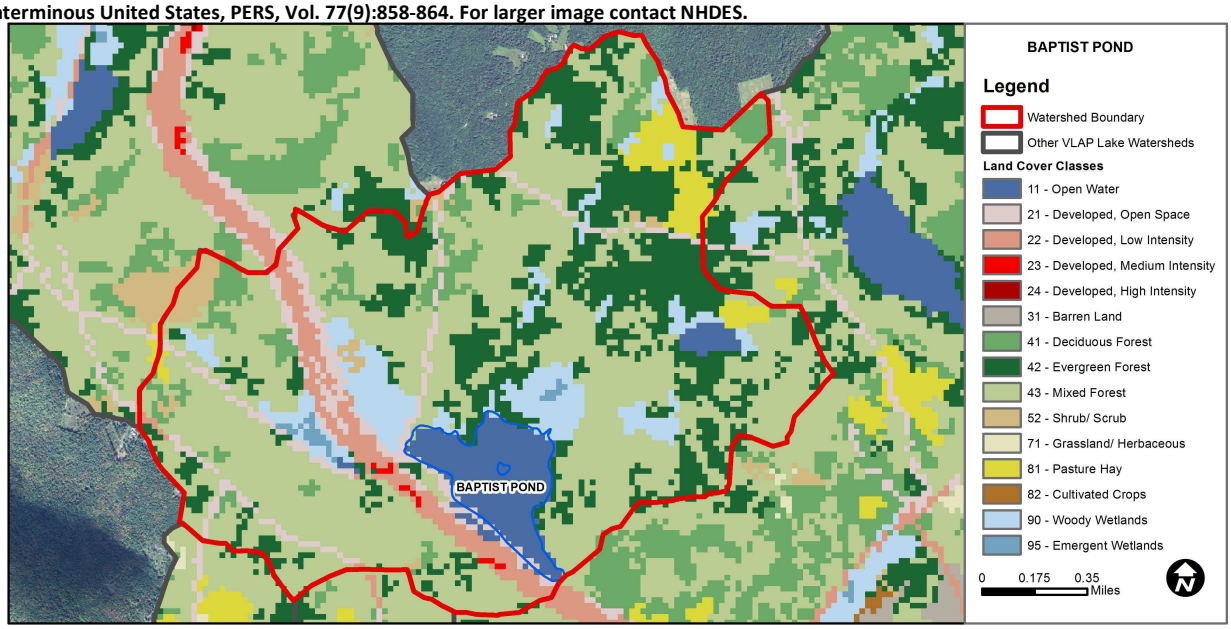
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Slightly Bad	The calculated median is from 5 or more samples and is > indicator and the chlorophyll a indicator is exceeded.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Slightly Bad	The calculated median is from 5 or more samples and is > indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

BAPTIST POND - CAMP SUNAPEE	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	5.89	Barren Land	0	Grassland/Herbaceous	0
Developed-Open Space	4.96	Deciduous Forest	4.94	Pasture Hay	2.88
Developed-Low Intensity	3.73	Evergreen Forest	20.83	Cultivated Crops	0
Developed-Medium Intensity	0.2	Mixed Forest	47.11	Woody Wetlands	7.42
Developed-High Intensity	0	Shrub-Scrub	1.51	Emergent Wetlands	0.44

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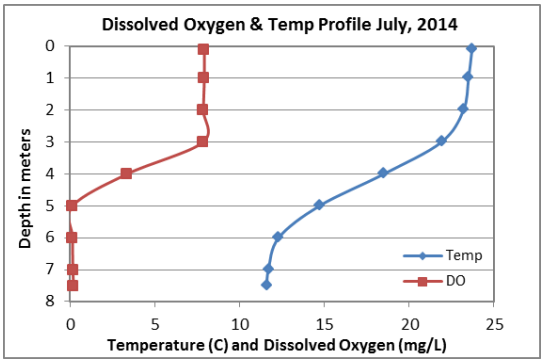
Baptist Pond, Springfield

2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **Chlorophyll-a:** Chlorophyll levels were elevated and indicated an algal bloom occurred between May and July. Chlorophyll levels decreased in August, however the 2014 average was the highest measured since monitoring began. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Stoney Bk. Inlet and Outlet conductivity and chloride levels remained elevated due to runoff from I-89. McAlvin Inlet conductivity levels ranged from 24.6-106.5 uS/cm and appeared normal for that station. Conductivity was lowest after significant rainfall flushed the system and highest during dry conditions. McAlvin Bk. and Pond conductivity and chloride levels were approximately equal to state medians. Historical trend analysis indicates highly variable epilimnetic (upper water layer) conductivity since monitoring began.
- **Total Phosphorus:** Epilimnetic phosphorus levels were slightly elevated in May and likely contributed to the elevated algal growth. Phosphorus decreased to lower levels in July and August and historical trend analysis indicates highly variable epilimnetic phosphorus since monitoring began. Hypolimnetic (lower water layer) phosphorus levels were elevated in July at a deeper sample depth (7 m) and likely a better representation of hypolimnetic phosphorus levels. Dissolved oxygen levels in the hypolimnion were depleted to less than 1.0 mg/L in July and this can result in the release of phosphorus from bottom sediments, a process called internal loading. McAlvin Pond, Outlet and Stoney Bk. Inlet phosphorus levels were within an average range for those stations. McAlvin Inlet phosphorus levels were slightly elevated in July following significant storm event. McAlvin Bk. phosphorus levels were elevated on each sampling event and turbidity was also elevated. This station is located downstream of agricultural operations which likely contribute to the elevated phosphorus.
- **Transparency:** Overall, transparency decreased in 2014 due to the elevated algal growth in July and August and average transparency was the lowest measured since monitoring began. Historical trend analysis indicates relatively stable transparency since monitoring began.
- **Turbidity:** Epilimnetic turbidity was slightly elevated on each sampling event but not above average for the station. Metalimnetic (middle water layer) turbidity was slightly elevated in July likely due to algal growth. Hypolimnetic turbidity was elevated in July at a deeper sample depth likely due to the accumulation of organic compounds under anoxic conditions. McAlvin Inlet turbidity was within an average range for that station. McAlvin Bk. turbidity was elevated on each sampling event and low to moderate amounts of sediment/organic matter were noted in the samples. McAlvin Pond and Outlet turbidities were within an average range. Stoney Bk. Inlet turbidity was slightly elevated in July following a storm event and elevated in August during lower flows.
- **pH:** Deep spot and tributary pH levels fluctuated below the desirable range 6.5—8.0 units throughout the summer. Historical trend analysis indicates relatively stable epilimnetic pH since monitoring began.
- **Recommended Actions:** Sample the Hypolimnion at 7 meters instead of 5 meters to better assess internal phosphorus loading. This internal load could contribute to elevated algal growth. The increased frequency and intensity of storm events highlights the importance of managing stormwater runoff from lake and watershed properties, and particularly from I-89. Work with NH DES and NH DOT to form a group to discuss the stormwater impacts from I-89 and what can be done to address these issues at Baptist Pond and other area lakes. Keep up the great work!



NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Table 1. 2014 Average Water Quality Data for BAPTIST POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	6.43	12.94	32	146.9	10	1.96	2.53	1.35	6.66
Metalimnion				145.0	11			2.36	6.38
Hypolimnion				163.0	17			3.27	6.60
Mcalvin Brook			3	54.0	44			3.66	6.83
Mcalvin Inlet			3	66.4	20			1.60	6.27
Mcalvin Pond In Lake			3	20.5	12			1.41	6.46
Outlet			33	147.1	9			1.31	6.66
Stoney Brook Inlet			76	276.5	17			2.78	6.20

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data highly variable.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	Stable	Trend not significant; data highly variable.